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2000

Harvest and Post-harvest Management

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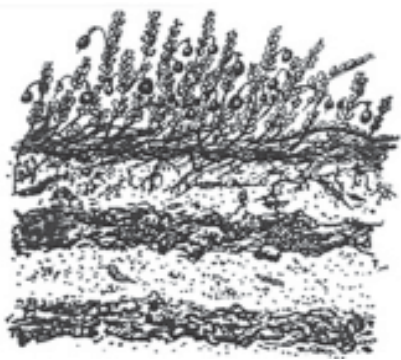


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DeMoranville, Carolyn and Sandler, Hilary A., "Harvest and Post-harvest Management" (2000). *Cranberry Station Best Management Practices Guide - 2000 Edition*. 14.

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BEST MANAGEMENT PRACTICES GUIDE FOR MASSACHUSETTS CRANBERRY PRODUCTION

Harvest and Post-harvest Management

Cranberries are harvested by two basic methods, dry harvest and water harvest. The dry harvest fruit is destined primarily for the fresh market while the water harvested fruit is processed. Growers manage cranberry plantings to facilitate these harvest methods and fruit uses. Ideally, the fruit are harvested at full maturity with good color (anthocyanin content) but prior to the fruit becoming over-ripe. Timing of harvest is important for fresh-market fruit so that the berries are sufficiently red but retain good storage quality, while fruit for the process market ideally has maximum color. Cranberry marketing companies produce 'no color added' products, so the color at harvest is of great importance in processed berries.

Following the harvest, management practices focus on minimizing harvest stress and preparing the bogs for the dormant season. To minimize disease and weed infestations, leaf litter and fallen fruit are removed from the bogs.

Recommended Practices

General:

- ◆ **Plan harvests based on cultivar and weather.**

Ben Lears and Early Blacks generally ripen before Stevens and Howes. It is important to remember that the earliest ripening cultivars are subject to physiological breakdown (sterile rot) by the end of the harvest season.

Ideally, the fruit are harvested at full maturity with good color (anthocyanin content) but prior to the fruit becoming over-ripe. Timing of harvest is important for fresh-market fruit so that the berries are sufficiently red but retain good storage quality, while fruit for the process market ideally has maximum color.

Factors that may slow color development are warm temperatures, particularly at night, and low exposure to sunlight (thick canopy).

- ◆ **Observe all Pre-harvest Intervals as required by law.**

Pre-Harvest Interval is defined as the number of days which must pass between the application of a pesticide and harvest. The interval varies for each pesticide and formulation and is designed to allow enough time to pass for the pesticide to breakdown so that consumer exposure is minimized.

Always observe proper Pre-Harvest Intervals (PHIs) for any pesticides that have been applied during the season. These intervals are listed on the pesticide labels.

- ◆ **Do not neglect irrigation needs in the early fall.**

Prior to and post-harvest, do not neglect the water requirements of the plants. Continue to monitor soil moisture and irrigate as needed. See the Irrigation BMP for further information.

Dry-harvested beds:

- ◆ **Manage the bed during the season to facilitate harvest.**

Dry harvested beds should be managed so that runner production and rank upright growth is minimized. Fertilizer rates should be low to moderate.

Pruning may be required periodically. This can be accomplished in the early spring or during harvest (Furford or Western pickers) or post-harvest.

- ◆ **Plan fruit rot control based on the UMass Extension Keeping Quality Forecast.**

Dry harvest fruit is generally sold in the fresh market, therefore, keeping quality is important. Often dry harvest beds are treated with additional fungicide applications to insure post-harvest quality. However, additional applications may not be required if the Keeping Quality Forecast is good to excellent.

Late water is an excellent tool for promoting good keeping quality and limiting fungicide requirements if the Preliminary Keeping Quality Forecast is poor. See the Flood Management BMP for further information.

- ◆ **Avoid moving weeds and disease inoculum from bed to bed.**

Dry harvest equipment should be cleaned of debris that might contain weed seeds prior to moving to the next bed. If a harvested bed is known to have *Phytophthora* infestation, sterilize equipment prior to harvesting any uninfested beds.

- ◆ **Use a post-harvest flood to relieve picking stress and remove leaf litter.**

Dry harvest techniques are stressful to the cranberry plants. A post harvest flood can minimize this stress and remove leaf trash at the same time (see below).

After detrashing, allow the flood to settle and release gradually over the top flume board to minimize discharge of sediments.

Water-harvested beds:

- ◆ **Manage the bed to maximize harvest returns.**

Fruit with good quality and high color (anthocyanin content) may command a premium price. While it is easier to water harvest fruit from overgrown beds (compared to dry harvest), overgrowth is often associated with poor color. Fertility, sanding, and pruning should be managed to promote adequate growth while allowing good light penetration into the canopy. This will promote yield and color.

- ◆ **Harvest floods should be managed so that water use is minimized.**

In order to conserve water, harvest should be managed so that water is re-used to harvest as many sections of bog as possible before the water is released from the system.

- ◆ **Avoid moving pests from bog to bog.**

Plan harvest water flow from bog to bog so that, whenever possible, water is **not** moved from disease or weed infested bogs into clean bogs. This is particularly important in controlling the spread of *Phytophthora* and dodder.

- ◆ **Hold harvest water to allow sediment to settle prior to release from the bog system.**

During harvest, sediments are suspended into the flood water. Discharge of sediment into wetlands and waterways is not permitted. Sediments should be allowed to settle for several days and flood water should be discharged over the top flume boards gradually to avoid sediment discharge to surface water.

A novel practice of holding the harvest flood for up to 4 weeks is under investigation by scientists at the Cranberry Station and a team of growers. This practice may have additional benefits in pest and weed control. See post-harvest section below.

Post-harvest management:

◆ Post-harvest floods may be used for insect and weed control.

Fall flooding in late September is a recommended option for the control of cranberry girdler. Cranberry girdler can be controlled with a fall flood beginning between September 25 and October 1 and lasting one week. The flood should completely cover the cranberry plants and is considered 'reasonably safe' even if fruit remains on the vines.

Ongoing research (suggested by grower practices) has shown that holding the harvest flood for up to 4 weeks post-harvest suppresses dewberry populations. Emergence of cranberry fruitworm the following spring was also suppressed. No reduction of crop has been reported after several years of experimentation with post-harvest floods.

◆ Use a trash flood to remove leaf litter and disease organisms from the bog.

Cranberry bogs may be flooded after harvest for the removal of 'trash'. This is particularly important if the bed was dry harvested. Although trash is removed during the water harvest, an additional trash flood may be beneficial if the bog has not been recently sanded. The leaf litter that builds up on the floor of the bed is a source of disease inoculum and a habitat for insect pests and is best removed from the bog.

After detrashing, allow the flood to settle and release gradually over the top flume board to minimize discharge of sediments.

◆ The use of post-harvest fertilizers is not recommended.

If fall fertilizer (post-harvest) is to be used, apply after the plants have achieved dormant color but as far ahead of the winter flood as possible. Do not use fall fertilizer if holding a post-harvest flood (fall flood) or on mineral soil beds.

◆ Clean ditches and waterways now.

In bogs that have adequate soil drainage, some actively growing aquatic vegetation should have been left in the ditches during the growing season to provide filtration in removing nutrients and residues from the water. Ditches should be cleaned post-harvest to facilitate moving water during the winter and to promote drainage in the spring. See the Erosion and Sediment Control BMP for further information.

◆ Limit the post-harvest use of herbicides to spot treatments of existing, defined weed populations.

Post-harvest use of casoron is not recommended.

Due to the high rates needed for efficacy of fall applications, post-harvest use of evital should be limited to the spot treatment of well-mapped areas of existing sensitive weeds such as nutsedge.

Glyphosate products may be used post-harvest and are effective if the target weed is still actively metabolizing (not yet dormant).

Refer to the Cranberry Chart Book for current herbicide rates and recommendations.

For further information:

DeMoranville, C. J. "Flood management". *in* Sandler, H. A., ed. **Cranberry Production: A Guide for Massachusetts**. UMass Extension Publication SP-127. December 1997. Second printing February 1998. pp.11-13.

DeMoranville, C. J. "Harvesting and handling cranberries". *in* Sandler, H. A., ed. **Cranberry Production: A Guide for Massachusetts**. UMass Extension Publication SP-127. December 1997. Second printing February 1998. pp.35-39.

Water Resource Protection and Enhancement and Flood Management BMPs in this series.

Prepared by Carolyn DeMoranville (Project Leader) and Hilary Sandler. Production of this Management Guide was supported by Massachusetts Department of Food and Agriculture as part of the Agro-Environmental Technology Grants Program. Matching funds were provided by University of Massachusetts Extension (USDA Cooperating) and Cape Cod Cranberry Growers Association. UMass Extension offers equal opportunity in programs and employment.

Artwork by Meredith Albright, freelance scientific illustrator, Bellingham, MA.

2000